

Claims

1. An internal planar antenna for a radio apparatus, comprising a ground plane, radiating plane, a feed conductor for the latter, and a short-circuit conductor which connects the radiating plane to the ground plane at a short-circuit point, the ground
5 plane including at least one non-conductive slot to improve matching of the antenna, a starting point of the slot being in an edge of the ground plane.
2. An antenna according to claim 1 the ground plane being a conductive layer on the upper surface of a circuit board in the radio apparatus, and the radiating plane being a conductive plane above the ground plane and having an outline shaped
10 substantially like a rectangle, wherein said short-circuit point is located relatively close, in proportion to the lengths of the sides of the radiating plane, to a projection of a corner of the radiating plane in the circuit board, and said starting point of the slot is located relatively near the short-circuit point and travels substantially parallel to a long side of the radiating plane.
- 15 3. An antenna according to claim 2, wherein said slot in the ground plane increases the physical length of the ground plane as measured from the short-circuit point.
4. An antenna according to claim 1 having at least a lower and an upper operating band, wherein the ground plane includes a first and a second non-conductive
20 slot.
5. An antenna according to claim 4 where said feed conductor passes through the circuit board at a feed point, the second slot starting from the same edge of the ground plane as the first slot and traveling substantially parallel to the first slot, said feed point being located between the first and second slots on the circuit board.
- 25 6. An antenna according to claim 5, further comprising a capacitor connected across the second slot in the ground plane.
7. An antenna according to claim 1, further comprising a capacitor connected across said at least one slot in the ground plane.
8. An antenna according to claim 5, the second slot in the ground plane being
30 arranged to resonate in the upper operating band of the antenna.

9. An antenna according to claim 1 having at least a lower and an upper operating band, said slot in the ground plane being arranged to resonate in the upper operating band of the antenna.
10. An antenna according to claims 4, the second slot starting from an edge of the ground plane which is opposite to that edge from which the first slot starts, and the first slot being arranged to resonate in the upper operating band of the antenna.
11. An antenna according to claim 4, at least one slot in the ground plane including a portion the direction of which differs substantially from the direction of said long side of the radiating plane.
12. A radio apparatus with an internal planar antenna comprising a ground plane on a circuit board, a radiating plane, a feed conductor for the latter and a short-circuit conductor which connects the radiating plane to the ground plane at a short-circuit point, the ground plane including at least one non-conductive slot to improve matching of the antenna, a starting point of the slot being in an edge of the ground plane.